GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Thermal Engineering and Central Heating I, PG_00042688		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Arkadiusz Ostojski	
	Teachers	dr inż. Arkadiusz Ostojski	

Lesson types and methods of instruction							
	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	25.0	0.0	0.0	0.0	0.0	25
	E-learning hours included: 0.0						

Learning activity and number of study hours					
	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	25	5.0	70.0	100

Subject objectives

The aim of the course is to provide knowledge about the current requirements for thermal protection of buildings, heating systems, and hot water preparation.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W08] has elementary knowledge of construction: including building materials, their strength, construction mechanics and building physics, moisture migration in buildings, heat transfer through building partitions	The student must demonstrate basic knowledge of building physics. He knows the mechanism of heat transfer through building partitions and the current legal requirements for thermal protection of buildings.	[SW1] Assessment of factual knowledge
[K6_W09] has ordered, theoretically founded knowledge in the field of water supply, sewage, heating, ventilation and air conditioning, and the principles of shaping the microclimate of rooms; knows legal regulations, standardization issues and recommendations for the design of water supply, sewage, heating and gas networks and installations	Distinguishes between the types of heating systems and domestic hot water preparation. He knows the current legal requirements for thermal protection of buildings and heating installations.	[SW1] Assessment of factual knowledge
[K6_U11] can use selected computer programs to support design, including CAD graphics programs	to be implemented in semester 6	[SU4] Assessment of ability to use methods and tools
[K6_U12] can design installations, networks and facilities: water supply, sewage, heating and gas	to be implemented in semester 6	[SU3] Assessment of ability to use knowledge gained from the subject
[K6_U02] can work individually and in a team; knows how to estimate the time needed to complete the task ordered; is able to develop and implement a work schedule that ensures deadlines	to be implemented in semester 6	[SU1] Assessment of task fulfilment

Subject contents	Lecture: Basics of heat transfer (conduction, convection, radiation). Thermal conductivity of building materials. Calculation values of thermal conductivity. Heat transfer resistances. Thermal resistance of homogeneous and heterogeneous partitions. Air layer resistance. Thermal resistance of ventilated and unventilated air layers. Heat transfer coefficient. Calculation of the heat transfer coefficient of building partitions. Temperature distribution in the partition. Thermal bridges in the partitions. Heat losses to the ground. Air temperature design values. Heat losses through building partitions. Air infiltration. Heat losses on heating the ventilation air. Total design heat loss of the rooms and the design load on the entire building. Energy certificates for buildings. Types of low-temperature heating systems (gravity - pump, with a lower - upper separation, one - two - pipe, floor). Applied protection of open and closed heating installations. Regulation of heating systems. Ways of preparing domestic hot water.
Prerequisites and co-requisites	Knowledge of the subject Thermodynamics (SNPK 22).
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Written exam	60.0%	100.0%

Recommended reading	Basic literature	1) Koczyk H. (red.): Ogrzewnictwo. Podstawy projektowania cieplnego i termomodernizacji budynków. Poznań: Wydawnictwo Politechniki Poznańskiej 2000 2) Krygier K., Klinke T., Sewerynik J.: Ogrzewnictwo, wentylacja i klimatyzacja. Warszawa: Wydawnictwa Szkolne i Pedagogiczne 1997. 3) Pieńkowski K., Krawczyk D., Tumel W.: Ogrzewnictwo. T. 1. Białystok: Rozprawy Naukowe nr 63, 1999.
	Supplementary literature	1) Koczyk H. (red.): Ogrzewnictwo praktyczne. Projektowanie, montaż, eksploatacja. Poznań: Systherm Serwis 2005.
	eResources addresses	Adresy na platformie eNauczanie: Technika cieplna i ogrzewnictwo 23/24 studia niestacjonarne - Moodle ID: 33873 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33873
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	